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I HEREBY CERTIFY that annexed hereto is a true copy of the documents filed in connection with the following patent application:

Application No. S2002/0038

Date of Filing 24 January 2002

Applicant EXA SA, a Swiss company of Case Postale 40,  
CH-1223 Geneva, Switzerland.

Dated this 4<sup>th</sup> day of November 2002.

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*Brian McKernan*

An officer authorised by the  
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## REQUEST FOR THE GRANT OF A PATENT

PATENTS ACT, 1992

The Applicant(s) named herein hereby request(s)

☐ the grant of patent under Part II of the Act

☒ the grant of short-term patent under Part III of the Act

on the basis of the information furnished hereunder.

1. Applicant(s)

Name Exa SA

Address Case Postale 40, CH-1223 Geneva, Switzerland

Description/Nationality

A Swiss Company

2. Title of Invention

"Cleaning Agent and a Process for Removing Coatings"

3. Declaration of Priority on basis of previously filed  
Application(s) for same invention (Sections 25 & 26)

Previous filing date

Country in or for  
Which filed

Filing No

4. Identification of Inventor(s)

Name(s) of person(s) believed

By Applicant(s) to be the inventor(s) Pierre ROCHAT

Address

18 Chemin de la Haute Belotte  
1222 Vesenaz, Geneva  
Switzerland

5. Statement of right to be granted a patent (Section 17 (2) (b))

6. Items accompanying this Request – tick as appropriate

- (i) ☒ Prescribed filing fee (EUR 60.00)
- (ii) ☐ Specification containing a description and claims  
☒ Specification containing a description only  
☒ Drawings referred to in description or claims
- (iii) ☐ An abstract
- (iv) ☐ Copy of previous application(s) whose priority is claimed
- (v) ☐ Translation of previous application whose priority is claimed
- (vi) ☐ Authorisation of Agent (this may be given at 8 below if this Request is signed by the Applicant(s))

7. Divisional Application(s)

The following information is applicable to the present application which is made under Section 24-

Earlier Application No: .....  
Filing Date: .....


8. Agent

The following is authorised to act as agent in all proceedings connected with the obtaining of a patent to which this request relates and in relation to any patent granted

<u>Name</u>	<u>Address</u>
Naoise Gordon	Murgitroyd & Co. Regus House Harcourt Centre Harcourt Road Dublin 2

9. Address for Service (if different from that at 8)

Signed For and on behalf of the Applicant Company by

  
Naoise Gordon  
(Agent for the Applicant)

Date 24 January 2002

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1     Cleaning Agent and a Process for Removing Coatings

2

3     The present invention relates to a process for  
4     cleaning a surface of the type which employs a  
5     particulate cleaning agent. The invention also  
6     relates to a particulate cleaning agent and a  
7     process for the production thereof.

8

9     Cleaning of the surfaces of various types of  
10    equipment and structures is often desirable.  
11    Numerous processes and cleaning agents are known in  
12    the art. The choice of process and agent depends to  
13    a great extent on the coating to be removed and on  
14    the substrate. In addition, the working conditions  
15    and the environmental effects of the process and  
16    agent used are becoming increasingly important  
17    factors when selecting an optimal cleaning  
18    technique.

19

20    Sand blasting and other abrasive techniques are  
21    quite applicable on hard substrates, but require

1 special arrangements to meet the specification.  
2 related to environment and working conditions.  
3

4 Less hard and durable substrates like aluminium,  
5 wood and composite materials require processes and  
6 cleaning agents which do not cause mechanical or  
7 chemical damage to the surface of the substrate.  
8

9 An object of the present invention is to select  
10 agents for cleaning, decontaminating, and removing  
11 coatings, which agents are environmentally  
12 acceptable and do not possess the limitations and  
13 disadvantages of known agents.  
14

15 A further object is the provision of an improved  
16 process for cleaning substrates without  
17 substantially damaging, mechanically or chemically,  
18 the substrate surface.  
19

20 According to the invention, there is provided a  
21 process for cleaning a surface of the type which  
22 employs a cleaning agent comprising a plurality of  
23 particles, the process comprising the step of  
24 projecting and/or accelerating the particles of the  
25 cleaning agent towards, or along, the surface to the  
26 cleaned such that at least some of the particles  
27 roll along at least a portion of the surface,  
28 wherein an angle of incidence of the particles and  
29 the surface is between 0° and 60°, and wherein the  
30 particles are dimensioned to effect a rolling  
31 movement along the surface.  
32

1 When the projected particle impacts the substrate at  
2 a low angle of incidence it rolls along the surface,  
3 rubbing and absorbing the coating from the surface.  
4

5 Preferably, the particles are generally round. In  
6 this specification the term "generally round" as  
7 applied to particles should be understood to mean  
8 any shape which of particle which enables the  
9 particle to easily assume a rolling motion when  
10 moved along a surface. As such, while the term is  
11 primarily intended to refer to spherical particles,  
12 it is not intended to exclude other types of  
13 spheroids such as spheres having an oblong or  
14 elliptical shape. Typically, the particles will  
15 have an irregular surface configuration.  
16

17 Ideally, the particles are relatively soft.  
18 Generally, the particles have an average hardness of  
19 less than 10 Mohs, typically less than 8 Mohs, and  
20 preferably less than 6 Mohs. Typically, the  
21 particles will have an average hardness of at least  
22 1 Mohs, and preferably of at least 2 Mohs. In a  
23 preferred embodiment of the invention, the particles  
24 will have an average hardness of about 3 Mohs.  
25 Typically, the particles have an average maximum  
26 diameter of between 30 and 1000 microns.  
27

28 When the process of the invention involves  
29 projecting and/or accelerating the particles towards  
30 the surface, various means of projection are  
31 envisaged, such as for example, mechanical  
32 projection (i.e. centrifugal particle acceleration),

1 pneumatic particle projection and electrostatic  
2 particle projection. A mechanical particle  
3 projecting device which is suitable for carrying out  
4 the process of the invention is described in  
5 International Patent Application No PCT/EP00/09960.

6

7 The process of the invention also encompasses manual  
8 projection of the particles along the surface. In  
9 this regard the particles may be rubbed along the  
10 surface using a cloth, by hand, or by any other  
11 means.

12

13 The invention also relates to a particulate  
14 composition for use in cleaning a surface, the  
15 composition comprising a multiplicity of particles,  
16 each particle being generally round such that upon  
17 impacting with the surface at an angle of incidence  
18 of between  $0^\circ$  and  $60^\circ$ , the particle rolls along the  
19 surface.

20

21 The invention also relates to the particulate  
22 composition of the invention for use in the  
23 manufacture of a cleaning agent, particularly an  
24 industrial cleaning agent.

25

26 The invention also relates to a process for  
27 producing the particulate cleaning composition and  
28 cleaning agent of the invention, the particulate  
29 composition and cleaning agent being obtainable by  
30 precipitation or flocculation of a suitable  
31 carbonate. Typically, the carbonate is calcium  
32 carbonate. Alternatively, the carbonate may be

1 magnesium carbonate. In a further embodiment of the  
2 invention, the particle composition comprises an  
3 alkali sulphate or magnesium sulphate. In a yet  
4 further embodiment of the invention, the particle  
5 composition comprises a plastic, metal, polymer or  
6 any other material having the required physical  
7 characteristics.

8  
9 Use of the process and cleaning agent of the  
10 invention has the effect of removing coatings  
11 without damaging the surface of the substrate. It  
12 should also be possible to clean complete structures  
13 and equipment having complex geometrical  
14 configurations such as valves, bridges etc having  
15 parts which are difficult to access with  
16 conventional cleaning equipment or blasting jets.

17  
18 After having cleaned the substrate according to the  
19 process of the invention the cleaning agent is  
20 easily removed together with the removed coating.  
21 The cleaning agent itself is environmentally  
22 acceptable.

23  
24 The invention will be more clearly understood from  
25 the following description of some embodiments  
26 thereof, given by way of example only, with  
27 reference to the following figures in which:

28  
29 Fig 1 is an illustration of a particle of a cleaning  
30 agent according to the invention; and

31  
32 Fig 2 illustrates the process of the invention.



1  
2 The present invention has been found to be effective  
3 at removing various types of coatings from  
4 substrates having hardness from that of steel to  
5 wood (or even softer materials) without causing  
6 damage to the subtracts surface. The cleaning agent  
7 can easily be removed by flushing with water. The  
8 person carrying out the cleaning process is not  
9 exposed to any harm and the agent is acceptable from  
10 an environmental point of view. The agent is also  
11 available in desired qualities, particle size,  
12 hardness etc.

13  
14 Referring to the drawings, and initially to Fig 1,  
15 there is illustrated a particle, indicated generally  
16 by the reference numeral 1, which is used in the  
17 process of the invention. The particle has a  
18 generally round, and slightly irregular, shape and a  
19 rough, irregular, surface configuration.

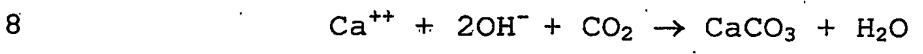
20  
21 Referring to Fig 2, the process of the invention is  
22 illustrated in which the particle 1 is projected  
23 towards a surface 2 having a coating 3 to be  
24 removed. Due to the low angle of incidence of the  
25 particle 1 and the surface 2, and the generally  
26 round shape of the particle 1, upon impact the  
27 particle 1 rolls along the surface, rubbing the  
28 surface and absorbing the coating 3 onto a surface  
29 of the particle. This has the net effect of  
30 removing the coating from the surface without  
31 causing any damage to the surface.

32

1     Example 1

2  
3     Method of production of particles.

4  
5     Production of insoluble particles CaCO<sub>3</sub> is done  
6     having free Ca<sup>++</sup> in a liquid with a PH over 7.  
7     Then we add CO<sub>2</sub> and obtain precipitated CaCO<sub>3</sub>.



9     We obtain different type of particles and  
10    crystalisation type by the regulation of the  
11    conditions of the precipitate

12  
13    Various other methods of production of particles  
14    according to the invention have been investigated  
15    using various types of substrates including plastic,  
16    metal and polymer. Examples of these methods  
17    include:

18  
19    Chemical

20  
21    There are numerous chemical methods for producing  
22    spherical powders. Generally, chemical methods  
23    result in very fine powder particle sizes. Such  
24    methods include Sol Gel, chemical precipitation,  
25    Reaction, reduction (hydrogen in an autoclave to  
26    reduce metal salts to the metal), decomposition (eg  
27    metal carbonyls) and Electrolysis.

28  
29    Spray drying

30  
31    This is the most widely used industrial process  
32    involving particle formation and drying. It is

1 highly suited for the continuous production of dry  
2 solids in either powder, granulate or agglomerate  
3 form from liquid feedstocks as solutions, emulsions  
4 and pumpable suspensions

5

#### 6 Agglomeration

7

8 The most common method of agglomeration is where the  
9 constituents are physically mixed together with an  
10 organic binder. The solvent is then driven off and  
11 the resultant material sized. The binder should be  
12 burnt off during spraying. This process is used in  
13 the manufacture of NiAl, AlSi or polyester powders.

14

#### 15 Atomisation

16

17 There are a number of atomisation techniques which  
18 all rely on the production of a molten pool as the  
19 source. Atomisation methods include Rotating  
20 Electrode, Vibrating Electrode (arc), Centrifugal  
21 (from a melt) and Rapid Solidification (eg aluminium  
22 ribbon). However, by far the most commonly used  
23 methods are either water or gas atomisation.

#### 24 Others

- 25 - Solid State Reduction
- 26 - Electrolysis
- 27 - Electrodeposition
- 28 - Mechanical Comminution

29

1 The invention is not limited to the embodiments  
2 hereinbefore described which may be varied in both  
3 construction and process step without departing from  
4 the invention.

5

6

Fig. 1

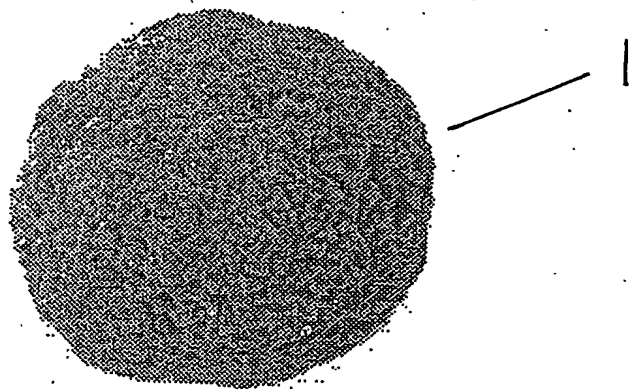
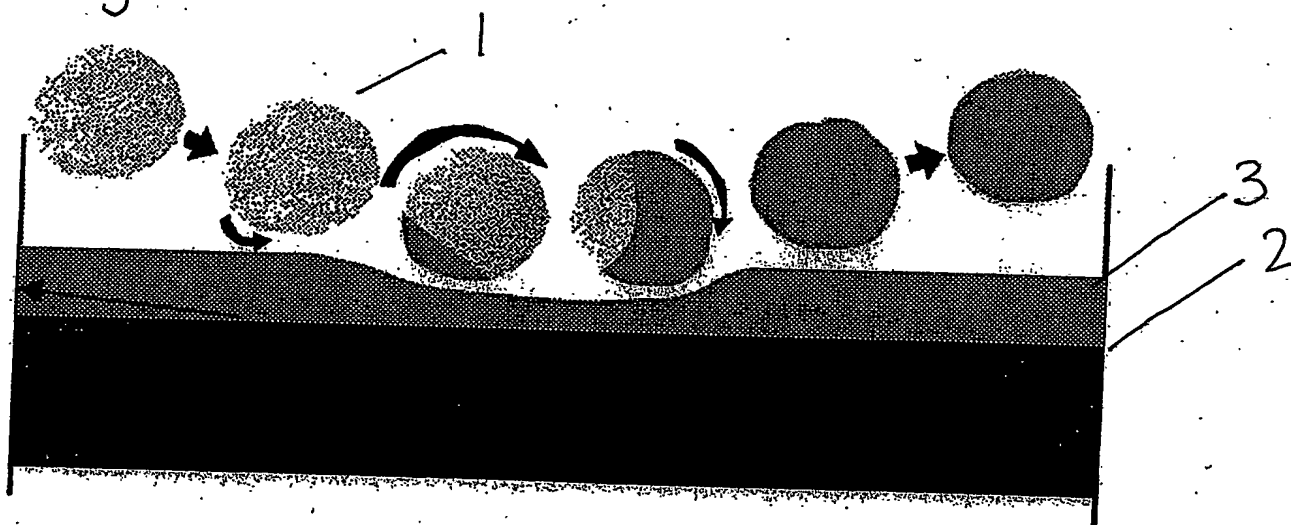


Fig. 2



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